

Endoscopy in Amphibians

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KEYWORDS

• Amphibians • Endoscopy • Diagnosis • Biopsy

KEY POINTS

- The majority of endoscopy procedures described in reptiles (especially lizards) can be undertaken in most amphibians.
- Coelioscopy is a safe and effective technique to directly visualize visceral organs and collect tissue samples.
- Coelioscopy is a valuable complement to radiography and ultrasonography.
- Like other imaging methods, the large number of amphibian species requires special knowledge of anatomic differences.

INTRODUCTION

More than 7360 species of amphibians exist, of which 6488 belong to the Anura (frogs and toads), 673 to the Caudata (newts and salamanders), and 200 to the Gymnophiona (caecilians).¹ Only the commonly maintained companion animal species are discussed here; therefore, caecilians have been excluded.

There have been sporadic reports of amphibian endoscopy since the 1980s. Most previous reports describe the use of endoscopy to examine gender or retrieve foreign bodies.^{2–5} In contrast with reptile medicine, where endoscopy has been well-developed, the literature is scarce in amphibians. The greatest limiting factor is probably equipment compatibility owing to the small size of most amphibians. In addition, anesthesia can also be challenging; however, valuable information may be gained by passing a small, rigid endoscope through the oropharynx into the stomach or into the coelomic cavity.

With appropriate equipment, many species of newts, salamanders, frogs, and toads can be examined internally with minimal trauma and discomfort. Endoscopy is a useful complementary tool to radiography and ultrasonography.⁶ However, it is often difficult to interpret images in such small animals. Misdiagnosis is not uncommon. Endoscopy produces a 2-dimensional representation including size, color,

The author has nothing to disclose.

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Vet Clin Exot Anim ■ (2015) ■–■

<http://dx.doi.org/10.1016/j.cvex.2015.04.006>

vetexotic.theclinics.com

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contours, and spatial awareness of other structures. In this author's experience, endoscopy in amphibians permits visualization of almost all the coelomic organs from a single point of entry.

INDICATIONS

In the author experience, the main indications of endoscopy in amphibians are as follows.

- Gender identification.
- Retrieval of foreign bodies from the upper gastrointestinal tract.
- Rapid, magnified, ante mortem or post mortem assessment of intracoelomic lesions in cases of high mortality in a colony.
- Valuable diagnostic tool when confronted by nonpathognomonic clinical signs, such as anorexia, weight loss, or loss of pigmentation.
- Biopsies of tissues and coelomic organs.

CONTRAINDICATIONS

Given the application of the 2.7-mm or the 1.9-mm system, the small size of the animal is the most common limitation/contraindication. Sick animals with high anesthetic risks should not undergo endoscopy.

EQUIPMENT

Despite the variation in size and the nature of the procedures that may be performed, the basic endoscope system consist of the following.

- A 1.9-mm integrated telescope.
- A 2.7-mm diameter, 18-cm length, 30° oblique rigid telescope with a 4.8-mm operating sheath.
- An Endovideo camera and monitor.
- A xenon light source and light cable.
- A 1- or 1.7-mm endoscopic biopsy forceps and grasping forceps (an endoscopic needle is optional).
- Carbon dioxide (CO₂) insufflator with silicone tubing. Care must be taken when using CO₂ insufflation, because it can quickly dry out the organs and the mucosa. Therefore, in the author experience, the endoscopic procedure should not last more than 10 minutes. A simple syringe for air or saline infusion is also practical.

PATIENT PREPARATION

Because most amphibians are presented in a state of advanced disease, they need to be stabilized before undergoing anesthesia and endoscopy. The amphibian patient should be handled with care, and wrapping with a wet paper towel is a good technique to restrain an animal for a quick examination or for medication administration. Wearing moistened, powder-free gloves prevents the transfer of microorganisms or chemicals from the handler as well as protection against secreted toxins. Manual restraint is used for short and nonpainful procedures. As long as the animal is outside his natural environment, his integument should be moistened regularly with dechlorinated water. For a better visualization, it is advisable to fast large frogs and toads for 24 to 48 hours before anesthesia. Preoperative preparations include hydration of the animal in a shallow, dechlorinated water bath.

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